CLAIMS

1. A process for the preparation of cephalexin, characterized in that crosslinked hydrophilic carrier polymer materials which have binding activity for ligands having nucleophilic groups, are in bead form and can be prepared by inverse bead polymerization of a monomer phase which consist of monomers and a diluent, where the monomers present are

(a) 5-40% by weight of hydrophilic monomers which are capable of free-radical polymerization, have a vinyl group and form at least 10% strength aqueous solutions at room temperature,

(b) 30-50% by weight of monomers which are capable of free-radical polymerization and have a vinyl group and an additional functional group which is able to enter into covalent bonds in a polymer-analogous reaction with the nucleophilic groups of the ligands,

(c) 20-60% by weight of crosslinking monomers which are capable of free-radical polymerization and have two or more ethylenically unsaturated polymerizable groups,

with the proviso that a), b) and c) add up to 100% by weight, and the diluent used is a mixture of methanol and water in the ratio from 1:1.0 to 1:4.0, where the monomer phase is dispersed to droplets in a continuous phase composed of an organic solvent composed of an aliphatic hydrocarbon having 5-7 carbon atoms, where the ratio of monomer phase to continuous phase is from 1:2.0 to 1:4.0, and in this form undergo free-radical polymerization in the presence of a polymerization initiator and of a protective colloid, with the proviso that the ratio of the monomers to the diluent is from 1:1.7 to 1:2.4, are coated with penicillin amidase, and these coated carriers are brought into contact with an aqueous solution which comprises

(i) 7-aminodeacetoxycephalosporanic acid and

(ii) D-phenylglycinamide

in a ratio of from 1:2 to 2:1.

2. The process as claimed in claim 1, characterized in that the monomers employed are

a) acrylamide and/or methacrylamide

b) glycidyl methacrylate and/or allyl glycidyl ether

c) N,N'-methylenebisacrylamide or N,N'-methylene-bismethacrylamide.

3. The process as claimed in claim 1 or 2, characterized in that cyclohexane is used as organic solvent.

4. The process as claimed in at least one of the preceding claims, characterized in that the penicillin amidase is derived from *E. coli*.

5. The use of a carrier polymer material as set forth in one or more of Claims 1 to 4 for the synthesis of cephalexin.